

# **Stratix 6000 Ethernet Managed Switches**

# Catalog Numbers 1783-EMS08T, 1783-EMS04T

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### **Important User Information**

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes. laws. and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

# **North American Hazardous Location Approval**

#### The following information applies when operating this equipment in hazardous locations.

Informations sur l'utilisation de cet équipement en environnements dangereux.

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A. B. C. D. Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.

Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A. B. C. D dangereux et non dangereux. Chaque produit est livré avec des marguages sur sa plague d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.



#### FXPI OSION HAZARD -

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I. Division 2.
- If this product contains batteries, they must only be changed in an area known to be nonhazardous.



#### RISOUE D'EXPLOSION -

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de déhrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres movens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I. Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.



**WARNING:** For 1783-EMS08T switches only, when you insert or remove the small form-factor pluggable (SFP) optical transceiver while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

# **European Hazardous Location Approval**



**ATTENTION:** This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.



#### WARNING:

- This equipment is not resistant to sunlight or other sources of UV radiation.
- This equipment must be installed in an enclosure providing at least IP54 protection when applied in Zone 2 environments.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Zone 2 environments.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

### **Environment and Enclosure**



**ATTENTION:** This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance

This equipment is supplied as open-type equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following publications:

- Publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines, for additional installation requirements
- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures

# **Preventing Electrostatic Discharge**



**ATTENTION:** This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.



**ATTENTION:** To comply with the CE Low Voltage Directive (LVD), all connections ot this equipment must be powered from a source compliant with the following: Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).



**ATTENTION:** To comply with ETL restrictions, all connections to this equipment must be powered from a source compliant with the following: Class 2.

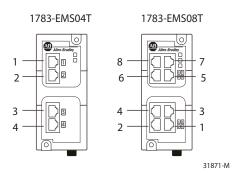
### About the Switches

These switches provide real-time access to network data through the Logix-based control system. The switches integrate into Logix programs and update tags automatically.

Use the switches to assist in continuously monitoring your network and implementing changes.

The figure shows Ethernet port identification for the 1783-EMS08T 8-port and the 1783-EMS04T 4-port switches.

#### **Ethernet Port Identification**



### Install the Switches

Mount the switches, as shown, in the vertical position only. We do not recommend horizontal mounting due to thermal considerations. When mounting:

- Provide 50 mm (2 in.) of space on all sides for adequate heat dissipation.
- Leave 100 mm (4 in.) for installation and removal if using the fiber-optic port on the bottom of the 1783-EMS08T switch.

**IMPORTANT** Use care with the plastic DIN rail clip.



**WARNING:** If you connect or disconnect the communication cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.



**WARNING:** If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

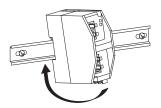
# **DIN Rail Mounting**

Read this section for information on how to install and remove a switch using DIN rail mounting.

### Install the Switch

To install the switch on DIN rail, proceed as follows.

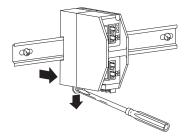
- 1. Mount your DIN rail.
- 2. Snap the DIN-rail latch into the closed position.
- 3. Hook the top slot over the DIN rail and push the switch into position on the DIN rail.



### Remove the Switch

To remove the switch from DIN rail, proceed as follows.

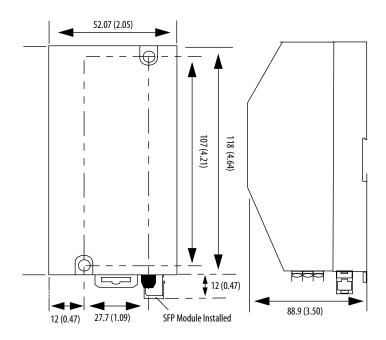
- 1. Place a screwdriver in the DIN-rail latch at the bottom of the switch.
- 2. Hold the switch and pry downward on the latch until the switch is released from the DIN rail.



# **Panel Mounting**

To panel mount a switch, create a mounting template, referring to the figure, which shows a 1783-EMS08T switch with an SFP module installed.

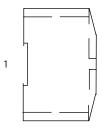
Provide 15 mm  $(0.6\,$  in.) clearance for DIN-rail latch movement during installation and removal. Dimensions in the figure are in mm (in.). These views are not actual size.

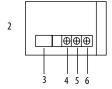


### Wire the Switch

Read this section for information about external power supply wiring.

Provide low voltage DC power to the switch by using the screw terminals at the bottom of the switch.





ltem	Description	ltem	Description
1	Side view	4	Ground
2	Bottom view	5	DC-
3	Fiber optic SFP slot (1783-EMS08T switch only)	6	DC +

Follow these steps to wire the switch.

- 1. Be sure power to the power supply is turned off.
- 2. Be sure you have the proper gauge of wire for your power supply.
- 3. Strip approximately 0.9 mm (0.35 in.) from each end of the wire.
- **4.** Using a Phillips screwdriver, loosen the screw terminals on the terminal strip at the bottom of the switch.
- Connect DC+ (24V DC nominal) from the power supply to the DC+ terminal and tighten the screw.
- Connect DC- (0V DC) from the power supply to the DC- terminal and tighten the screw.
- Connect functional earth ground to the ground terminal and tighten the screw.
- 8. Refer to the grounding considerations on page 15.
- 9. Tug gently on the wires to ensure the connections are secure.

# **Connect the Copper Ethernet Ports**

Follow these steps to connect the copper Ethernet ports on the switch.

- 1. Locate the copper Ethernet RJ-45 ports on the switch.
- Connect one end of an Ethernet cable to one of the copper ports on the switch.
- Connect the other end of the Ethernet cable to a device in your Ethernet network.

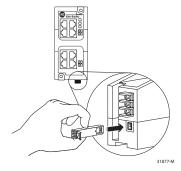
# **Install an Optional SFP Module**

To install a 1G fiber small form-factor pluggable (SFP) module into the fiber optic Ethernet slot on the bottom to the 1783-EMS08T switch, grasp the SFP module on the sides and insert it into the slot until you feel the connector snap into place.

TIP For detailed instructions on installing, removing, and connecting to SFP modules, see the documentation that shipped with the SFP module.

Available SFP modules include the following:

- 1783-SFP1GSX 1000BASE-SX multi-mode fiber transceiver
- 1783-SFP1GLX 1000BASE-LX single-mode fiber transceiver





ATTENTION: SFP modules are static sensitive devices. Always use an ESD wrist strap or similar individual grounding device when handling SFP modules.

#### **IMPORTANT**

Installing and removing an SFP module can shorten its useful life. Do not remove and insert SFP modules more often than is absolutely necessary.



#### ATTENTION:

If the SFP module cannot be fully inserted, stop!

Do not force the module into the slot.

Rotate the SFP module 180 degrees and try again.



**ATTENTION:** Under certain conditions, viewing the optical port may expose the eye to hazard. When viewed under some conditions, the optical port may expose the eye beyond the maximum permissible exposure recommendations.

**IMPORTANT** 

The 1783-EMSO8T switch supports 1G fiber SFP modules only.



**WARNING:** For 1783-EMS08T switches only, when you insert or remove the small form-factor pluggable (SFP) optical transceiver while power is on, an electrical arc can occur.

This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

# Connect the Fiber Optic Ethernet Port

Follow these steps to connect the fiber optic Ethernet port (on the SFP) in the 1783-EMS08T switch after inserting the SFP module.

- Connect the duplex LC connector end of the fiber optic cable, in the proper orientation, to the fiber optic Ethernet port on the SFP module installed at the bottom of the switch, as described in <u>Install an Optional</u> SFP Module.
- 2. Connect the other end of the cable to a device in your network or to another switch if connecting switches together.

# **Grounding Considerations**



**ATTENTION:** You must provide an acceptable grounding path for each device in your application. For more information on proper grounding guidelines, refer to publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. The functional earth ground connection to the product is through the specified pin on the DC connection terminals.

### **IMPORTANT**

The ground connection is required at the grounding pin on the DC connection terminals.

Refer to publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines, for additional information.

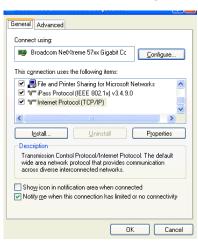
### Use the Switch

To start using your switch, follow this procedure. For information about the status indicators on the switch, refer to the Stratix 6000<sup>th</sup> Ethernet Managed Switch User Manual, publication <u>1783-UM001</u>.

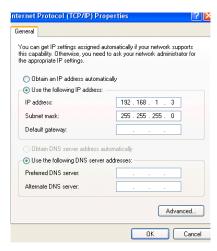
- Connect to your computer's LAN card by using patch cable or cross-over cable and following these steps.
  - a. Choose Start > Settings > Network Connections and right-click Local Area Connection and Properties.



 From the Local Area Connection Properties menu, check Ethernet Protocol (TCP/IP), and click Properties.



c. From the Ethernet Protocol (TCP/IP) Properties menu, change the IP address to 192.168.1.3 and Subnet mask to 255.255.255.0.



- 2. Connect to the switch via a Web browser by using these steps.
  - Open a browser window.
  - b. Enter the default IP address of 192.168.1.1 in the address bar, press Enter, and note the following defaults:
    - User name should be left blank.
    - Password is PASSWORD.
- Configure the switch.

You can get complete configuration instructions by clicking the link to view the embedded manual.

**4.** If the switch is to scan in a Logix 5000<sup>™</sup> program, refer to the appropriate section of your embedded manual.

# **Specifications**

### **Stratix 6000 Ethernet Managed Switches**

Attribute	1783-EMS08T	1783-EMS04T
Power requirements	1248V DC Class 2/SELV 250 mA @ 24V DC	1248 V DC Class 2/SELV 100 mA @ 24V DC
Power dissipation	5.8 W @ 60 °C (140 °F) max	2.6 W @ 60 °C (140 °F) max
Thermal dissipation	24.6 BTU/hr @ 60 °C (140 °F) max	
Network ports	8 RJ-45 10/100 full/half duplex ports, optional SFP transceiver port	4 RJ-45 10/100 full/half duplex ports
Protocols	TCP/IP, EtherNet/IP, Telnet, Http, DHCP, BOOTP, FTP, IGMP, SMTP	
Indicators	16 port indicators, 3 status indicators	8 port indicators, 2 status indicators
EtherNet/IP features	MAC ID management, bandwidth alarming, port control, link status, scaled bandwidth information, connections active	
Switch features	VLAN, IGMP snooping, IGMP query V1 and V2, DHCP server, BOOTP server, QoS, port mirroring	IGMP snooping, IGMP query V1 and V2, DHCP server, BOOTP server, QoS, port mirroring
Options	1 gigabyte fiber optic transceiver	_
Voltage variation	IEC 61000-4-29: 10 ms interruption on DC supply ports	
Enclosure type rating	Meets IP20	
Inrush current, max	2.2 A	
Isolation voltage	50 V (continuous), Basic Insulation Type No isolation between individual Ethernet ports Routine tested at 707V AC for 1 s, DC power ports to ground and DC power ports to Ethernet ports	

### Stratix 6000 Ethernet Managed Switches (continued)

Attribute	1783-EMS08T	1783-EMS04T
Wire size	Ethernet connections: RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e min cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 24702 DC Power connections: 0.33 3.3 mm² (2212 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater, 1.2 mm (3/64 in.) insulation max Functional ground connection: 3.3 mm² (12 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater	
Torque	DC power and functional ground: 1.36 Nm (12 pound-inches)	
Fiber optic Ethernet data rate <sup>(1)</sup>	1000 Mbps <sup>(1)</sup>	_
Fiber optic connecting mode <sup>(1)</sup>	Full duplex <sup>(1)</sup>	_
Fiber optic connector type <sup>(1)</sup>	LC <sup>(1)</sup>	_
Wiring category <sup>(2) (3)</sup>	2 - on DC power ports 2 - on Ethernet ports	
North American temp code	T4	
IEC temp code	T4	

- (1) Available when you purchase an optional SFP module.
- (2) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
- (3) Use this Conductor Category information for planning conductor routing as described in the appropriate system-level installation manual.

# **Environmental Specifications**

Attribute	1783-EMS08T, 1783-EMS04T
Emissions	CISPR 11: Group 1, Class A
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): 060 °C (32140 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Non-operating Thermal Shock): -4085 °C (-40185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 595% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10500 Hz
Operating shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 15 g
Nonoperating shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 802000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 20002700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on power ports ±1 kV at 5 kHz on Ethernet ports
Surge transient immunity	IEC 61000-4-5: $\pm$ 1kV line-line (DM) and $\pm$ 2 kV line-earth (CM) on DC power ports $\pm$ 2 kV line-earth (CM) on shielded Ethernet port
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz80 MHz
Magnetic field immunity	IEC 61000-4-8: 30A/m long duration and 300A/m short duration at 50 and 60 Hz

### Certifications

Certifications (when product is marked) <sup>(1)</sup>	1783-EMS08T, 1783-EMS04T
Œ	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	AS/NZS CISPR 11; Industrial Emissions
Ex	EN 60079-15; Potentially Explosive Atmospheres, Protection "n" (II 3 G Ex nA IICT4) EN 60079-0; General Requirements (Zone 2)
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications
c-UL-us	UL Listed Information Technology Equipment, certified for US and Canada. See UL File E151729.
c-ETL-us	ETL Listed Industrial Control Equipment, certified for US and Canada.
c-ETL-us	ETL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada

<sup>(1)</sup> See the Product Certification link at <u>www.ab.com</u> for Declarations of Conformity, Certificates, and other certification details.

### **Additional Resources**

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
EtherNet/IP Industrial Protocol White Paper, publication ENET-WP001	Describes how to implement services and data objects on a TCP/UDP/IP based Ethernet network.
Stratix 6000 Ethernet Managed Switch User Manual, publication 1783-UM001	Provides details about how to configure and use the switch.
Stratix 6000 Ethernet Managed Switch Release Notes, publication <u>1783-RN003</u>	Provides updates on switch operation.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <a href="http://literature.rockwellautomation.com">http://literature.rockwellautomation.com</a>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

# **Notes:**

# **Rockwell Automation Support**

Rockwell Automation provides technical information on the Web to assist you in using its products.

At <a href="http://www.rockwellautomation.com/support">http://www.rockwellautomation.com/support</a> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <a href="https://rockwellautomation.custhelp.com/">https://rockwellautomation.custhelp.com/</a> for software updates, support chats and forums, technical information. FAOs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

#### Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the <u>Worldwide Locator</u> at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

#### **New Product Satisfaction Return**

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

### **Documentation Feedback**

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at <a href="https://www.rockwellautomation.com/literature/">https://www.rockwellautomation.com/literature/</a>.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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